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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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[REDACTED] EXAMINER

SUCHFIELD, GEORGE A

ART UNIT	PAPER NUMBER
3672	18

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	09/841,490	Applicant(s)	WELLINGTON ET AL
Examiner	George Suchfield	Art Unit	3672

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 19 August 2002.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1058-1096 and 5397-5439 is/are pending in the application.
- 4a) Of the above claim(s) 1060-1062 and 5398-5439 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1058-1096 and 5397 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) 105801096 and 5397-5439 are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on 26 February 2002 is: a) approved b) disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5-17.
- 4) Interview Summary (PTO-413) Paper No(s) _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____

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1. Newly submitted claims 5398-5439 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

Claims 1058-1096, 5397 are unrelated to new claims 5398-5439 . Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions have different modes of operation, i.e., the invention of Claims 1058-1096 and 5397 inhibits the production of hydrocarbons having a carbon numbers greater than 25 by controlling the pressure in the formation, while the invention of claims 5398-5439 controls the pressure in the formation in order to produce fluids having a weight ratio of hydrocarbons having carbon numbers in a range of from 2-4 to methane of greater than approximately 0.3.

2. The originally presented invention, i.e., claims 1058-1096 and 5397 is deemed constructively elected by original presentation for prosecution on the merits. Accordingly, claims 5398-5439 stand withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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5. Claims 1058, 1059, 1063-1096 and 5397 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1058 recites the limitation "a pyrolysis zone" in line 3. There is insufficient antecedent basis for this limitation in the claim. In this regard, the claim must positively recite a step of establishing such a "pyrolysis zone".

Claims 1059, 1063-1096 and 5397 are similarly indefinite insofar as they depend from claim 1058.

6. Conflicts exist between claims of the following related ninety-one co-pending applications which includes the present application:

09/840,936; 09/840,937; 09/841,000; 09/841,060; 09/841,061; 09/841,127; 09/841,128; 09/841,129; 09/841,130; 09/841,131; 09/841,170; 09/841,193; 09/841,194; 09/841,195; 09/841,238; 09/841,239; 09/841,240; 09/841,283; 09/841,284; 09/841,285; 09/841,286; 09/841,287; 09/841,288; 09/841,289; 09/841,290; 09/841,291; 09/841,292; 09/841,293; 09/841,294; 09/841,295; 09/841,296; 09/841,297; 09/841,298; 09/841,299; 09/841,300; 09/841,301; 09/841,302; 09/841,303; 09/841,304; 09/841,305; 09/841,306; 09/841,307; 09/841,308; 09/841,309; 09/841,310; 09/841,311; 09/841,312; 09/841,429; 09/841,430; 09/841,431; 09/841,432; 09/841,433; 09/841,434; 09/841,435; 09/841,436; 09/841,437; 09/841,438; 09/841,439; 09/841,440; 09/841,441; 09/841,442; 09/841,443; 09/841,444; 09/841,445; 09/841,446; 09/841,447; 09/841,448; 09/841,449; 09/841,488; 09/841,489; 09/841,490; 09/841,491; 09/841,492; 09/841,493; 09/841,494; 09/841,495; 09/841,496; 09/841,497; 09/841,498; 09/841,499; 09/841,500; 09/841,501; 09/841,502; 09/841,632; 09/841,633; 09/841,634; 09/841,635; 09/841,636; 09/841,637; 09/841,638; and 09/841,639.

37 CFR 1.78(b) provides that when two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application. The discussion below sets forth the Office's basis for its determination that each of these ninety-one applications contains at least one claim that conflicts with another one of the related co-pending applications identified above. Each of these ninety-one applications includes the same specification and collectively these applications present over five thousand

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claims. The Office has shown that each of these ninety-one applications contains at least one claim that conflicts with another one of the related co-pending applications identified above, and an analysis of each of five thousand+ claims in the ninety-one related co-pending applications would be an extreme burden on the Office requiring tens of thousands of claim comparisons. Therefore, the Office is requiring applicant to resolve the conflict between these applications and comply with 37 CFR 1.78(b) by either:

- (1) filing a terminal disclaimer in each of the related ninety-one applications terminally disclaiming each of the other twenty-eight applications; or,
- (2) provide a statement that all claims in the ninety-one applications have been reviewed by applicant and that no conflicting claims exist between the applications. Such a statement must set forth factual information identify how all the claims in the instant application are distinct and separate inventions from all the claims in the above identified ninety-one applications.

Applicant is reminded that obviousness-type double patenting analysis entails a two-step process: (1) the claims of this application and the other ninety-one applications must be construed; and (2) the claims of this application must be compared with the claims of the other applications to determine whether the differences in subject matter between the two claims render the claims patentably distinct. See Georgia-Pacific Corp. v. United States Gypsum Co., 195 F.3d 1322, 1326, 52 USPQ2d 1590, 1593 (Fed. Cir. 1999), and General Foods Corp. v. Studiengesellschaft Kohle, 972 F.2d 1272, 1279, 23 USPQ2d 1839, 1844 (Fed. Cir. 1992). As the Court of Customs and Patent Appeals (CCPA) explained: “[t]he fundamental reason for the rule [against “double patenting”] is to prevent unjustified timewise extension of the right to exclude granted by a patent no matter how the extension is brought about.” In re Van Ornum, 686 F.2d 937, 943-44, 214 USPQ 761, 766 (CCPA 1982) (brackets and emphasis in the original) (quoting In re Schneller, 397 F.2d 350, 354, 158 USPQ 210, 214 (CCPA 1968)). Furthermore, the requirement will be held in abeyance until such time as the examiner indicates allowable subject matter. Examples of conflicts appear in the rejections here-in-below.

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321© may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 1058-1096 and 5397 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over copending applications (including the present application):

09/840,936; 09/840,937; 09/841,000; 09/841,060; 09/841,061; 09/841,127; 09/841,128; 09/841,129; 09/841,130; 09/841,131; 09/841,170; 09/841,193; 09/841,194; 09/841,195; 09/841,238; 09/841,239; 09/841,240; 09/841,283; 09/841,284; 09/841,285; 09/841,286; 09/841,287; 09/841,288; 09/841,289; 09/841,290; 09/841,291; 09/841,292; 09/841,293; 09/841,294; 09/841,295; 09/841,296; 09/841,297; 09/841,298; 09/841,299; 09/841,300; 09/841,301; 09/841,302; 09/841,303; 09/841,304; 09/841,305; 09/841,306; 09/841,307; 09/841,308; 09/841,309; 09/841,310; 09/841,311; 09/841,312; 09/841,429; 09/841,430; 09/841,431; 09/841,432; 09/841,433; 09/841,434; 09/841,435; 09/841,436; 09/841,437; 09/841,438; 09/841,439; 09/841,440; 09/841,441; 09/841,442; 09/841,443; 09/841,444; 09/841,445; 09/841,446; 09/841,447; 09/841,448; 09/841,449; 09/841,488; 09/841,489; 09/841,490; 09/841,491; 09/841,492; 09/841,493; 09/841,494; 09/841,495; 09/841,496; 09/841,497; 09/841,498; 09/841,499; 09/841,500; 09/841,501; 09/841,502; 09/841,632; 09/841,633; 09/841,634; 09/841,635; 09/841,636; 09/841,637; 09/841,638; and 09/841,639.

Although the conflicting claims are not identical, they are not patentably distinct from other. For example; claim 81 currently pending in 09/841,432 is an obvious variation of claim 1068 pending herein. More specifically, claim 81 calls for heating a coal formation and producing condensable hydrocarbons from the formation by conduction heating while altering the pressure to inhibit the production of hydrocarbons having carbon numbers > 25, while claim 1068, pending herein, calls for heating a hydrocarbon formation by conduction while controlling the pressure to inhibit the production of hydrocarbons having carbon numbers > 25. It is deemed, however, that such "altering" the pressure step of claim 81 necessarily or obviously comprises a step of "controlling" the pressure, as per pending claim 1068, since such pressure

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manipulation steps in both claims result in the inhibition of >C25 hydrocarbons from the coal formation.

It is further noted that claims 1058 – 1096 and 5397 are specifically not patentably distinct from claims 1058 - 1096 of applicant's copending application S.N. 09/841,441 , because the coal formation treated by the method of claim 1058 of the copending application is deemed to obviously comprise or encompass the hydrocarbon formation of claim 1058, pending herein. Otherwise, the remaining claims of both this and the copending application appear to correspond, with the additional limitation in claim 5397 to 20 heat sources per recovery well deemed an obvious matter of choice or design based on, e.g., the characteristics, properties and/or areal extent of particular hydrocarbon formation encountered in the field.

See MPEP 804.02 IV for a discussion of multiple double patenting rejections and the requirements for a single terminal disclaimer.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

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The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 1058, 1065, 1070-1084, 1095, 1096, 1091 and 1092 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Camacho et al (4,067,390) and the reference to MODERN PETROLEUM TECHNOLOGY by Hobson.

Camacho et al (col. 6, line 20 – col. 11, line 21) discloses a process for heating a coal or hydrocarbon formation wherein the heat imparted causes devolatilization and gasification of the coal. Camacho et al further calls for monitoring the composition of the product gases and controlling such product composition by one or more steps such as controlling the operating pressure within the coal formation. Insofar as a hydrocarbon having a carbon number greater than 25 normally possesses a constituency of a wax, as noted by Hobson in Table I on page 787, it is deemed that the volatiles and product gas comprising the production effluent in the coal treating process of Camacho et al will necessarily or obviously not include any such

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hydrocarbons having a carbon number greater than 25 since, as noted by Hobson, such hydrocarbon(s) would not comprise a "volatile", per se (note, e.g., the high melting points listed).

Accordingly, it is deemed that the process of Camacho et al, taken in light of the reference to Hobson, will inherently or obviously inhibit the production of hydrocarbons from the coal formation "having carbon numbers greater than 25" during the operation of controlling the product composition by, *inter alia*, controlling the pressure within the coal-formation (col. 11, lines 13-21), insofar as the product composition will contain virtually no such hydrocarbon component, as called for in independent claim 1058.

Pyrolysis clearly occurs in the said formation, as called for in claim 1065.

Regarding claims 1070-1084, it is deemed that the myriad hydrocarbon product mixtures recited in these claims would necessarily or obviously occur in carrying out the heating process of Camacho et al, i.e., the precise composition of the product fluids is seen as dictated by the type of coal naturally occurring in the particular coal formation actually encountered in the field. Moreover, it would be an obvious matter of choice to operate the Camacho et al process to minimize what would be considered refinery contaminants, such as sulfur, nitrogen and/or oxygen in the product mixtures. Similarly, it would be obvious to reduce or minimize the amount of asphaltenes in the product mixtures for optimum downstream refining. Also, in the event that the particular coal deposit encountered yields ammonia gas, it would be an obvious expedient to utilize it in a commercial process such as fertilizer production.

Camacho et al further effects "cracking or fracturing" of the coal, e.g., as illustrated by zone (40,40') of Figures 4 and 5. Such heating effect on the coal formation is deemed to necessarily or obviously increase the permeability, as called for in claims 1091, 1092. It is

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further deemed that such permeability increase will inherently or obviously be substantially uniform, as called for in claim 1092 as illustrated in Figures 4 and 5. Such permeability increase is deemed to necessarily or inherently encompass an increase to "greater than about 100 millidarcy", as called for in claim 1091; alternatively, to increase the permeability to greater than 100 millidarcy would have been an obvious matter of choice in order to ensure adequate fluid flow through the formation.

Regarding claims 1095 and 1096, Camacho et al (note Figure 8 and col. 9, lines 20-50) clearly discloses that the plasma arc torch heat sources (25) may be provided in a repeating triangular pattern.

12. Claims 1066-1069, 1085-1087, and 1093-1096 are rejected under 35 U.S.C. 103(a) as being unpatentable over Camacho et al (4,067,390) and the reference to MODERN PETROLEUM TECHNOLOGY by Hobson.

The precise heating rate and thermal conductivity recited in claims 1066 and 1067 are deemed obvious matters of choice or design based on, e.g., the quality and amount of the in place hydrocarbon present in the particular coal formation encountered in the field, consistent with objective of Camacho et al to provide a low rate of heating (col. 10, lines 34-40).

Insofar as the coal formation (11) may be of low initial permeability and/or porosity, it is deemed that at least some transfer of heat by conduction from the point(s) of combustion will necessarily or obviously occur during the Camacho et al process, as called for in claim 1068.

The thermal conductivity recited in claim 1069 is deemed an obvious matter of choice or design based on, e.g., the quality and type of the coal formation present and/or the matrix characteristics of the particular coal formation encountered in the field.

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The steps of 1085-1087, 1093 such as controlling the heat in the formation, are deemed obvious matters of choice or design in carrying out the process of Camacho et al. In this regard, Camacho et al teaches that steam injection temperature, pressure and/or volume may be controlled in response to monitoring of the fluid products. In addition, overall operating conditions within the coal formation may be altered (noted col. 5, lines 20-27) to vary the product fluid composition(s).

Regarding claims 1094-1096, Camacho et al in the embodiment of Figure 10 discloses that myriad heating wells (65) may surround a production well or shaft (74). The precise number of such heating wells provided, as called for in these claims, is deemed an obvious matter of choice or design in carrying out the process of Camacho et al based on, e.g., the overall areal extent of the coal formation(s) encountered in exploiting an actual reservoir encountered in the field.

13. Claim 1090 is rejected under 35 U.S.C. 103(a) as being unpatentable over Camacho et al (4,067,390) and the reference to MODERN PETROLEUM TECHNOLOGY by Hobson, as applied to claim 1058 above, and further in view of Hoekstra et al (4,353,418) or Garrett (3,661,423).

It would have been obvious to one of ordinary skill in the art to which the invention pertains to hydrogenate the hydrocarbons produced from the heating process of Camacho et al, which hydrocarbons may be in liquid and/or vaporous form, with hydrogen also produced by the heating process of Camacho et al (col. 2, line 44-49), as taught by Hoekstra et al (note the Abstract and figure) or Garrett (col. 4, lines 50-54), in order to simultaneously provide an

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exemplary "non-energy use" for hydrogen produced by Camacho et al and improve the overall quality of the liquid and/or condensable hydrocarbon fluids produced by Camacho et al.

14. Claims 1058, 1059, 1063, 1065-1086, 1088, 1089, 1091-1093 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Schlinger et al (3,617,471) and Slater (3,084,919).

Schlinger et al discloses a process for pyrolysis and hydroretorting a subterranean oil shale deposit or formation, which may be initially heated or exploited by the process of Slater (as referred to in col. 2, lines 62-67 of Schlinger). During the pyrolysis/hydroretorting operation, the pressure within the oil shale formation is controlled, e.g., between 300 – 1000 psig, preferably 400 – 600 psig, such that "maximum yields of shale oil of improved quality and containing a greater amount of C₆ material are obtained within this pressure range" and/or "hydroretorted shale oil ... of superior quality" is obtained (col. 4, lines 9-29).

Thus, it is deemed that the resulting produced shale oil, as described above, especially wherein a large amount of C₆ component is produced, will inherently or obviously contain a minimal amount of > C₂₅ hydrocarbons, which, as noted above in the reference source to Hobson, is of the constituency of wax – which would clearly not comprise a "superior quality" or "high quality" shale oil. Moreover, Schlinger explicitly desires to suppress the formation and production of constituents similar to C₂₅ hydrocarbons comprising "heavy polymers, unsaturated hydrocarbons and carbonaceous residues" (col. 3, lines 35-42). Accordingly, the process of Schlinger et al, as practiced or applied in a subterranean oil shale formation heated or prepared by the process of Slater, incorporated therein, heats, hydroretorts and controls the pressure within the oil shale formation such that production of hydrocarbons having carbon

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numbers greater than C25 is inherently or obviously inhibited, as called for in independent claim 1058.

As per claim 1059, it is deemed that during the initial heating phase and/or the hydroretorting phase of Schlinder et al, as practiced using the multi-well arrangement of Slater, as illustrated, it is deemed that at least some overlap or “superposition” of the heating from each wellbore will inherently or obviously occur.

As per claim 1063, the process of Schlinder et al, as applied to the oil shale formation illustrated and completed in Slater, incorporated therein, may employ the in situ combustion step(s) of Slater, i.e., as comprising the embodiment wherein “the oil shale reaction zone may be externally heated” (col. 2, lines 62-67 of Schlinder et al). Moreover, Slater indicates that, at one point in the heating, formation shale oil is burned in the well and the combustion products are produced to the surface, thus comprising a “natural distributed combustor”, as recited.

As per claim 1065, pyrolysis clearly occurs in the formation, as noted above with respect to claim 1058.

It is deemed that the precise heating rates set forth in claims 1066 and 1067, as well as the thermal conductivity recited in claim 1069, will inherently or obviously occur during the process of Schlinder et al, as applied to the oil shale formation completed by Slater, based on or dictated by, e.g., the characteristics and properties of the oil shale formation actually encountered in the field.

As per claim 1068, during the initial heating phase of Schlinder et al, i.e., deploying the wellbores of Slater, it is deemed that the heating will inherently or obviously occur by

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conduction because it is disclosed that the wellbore combustion products are produced back up the wellbore(s), apparently in lieu of providing convective heat transfer to the formation.

Regarding claims 1070-1084, it is deemed that the myriad hydrocarbon product mixtures recited in these claims would necessarily or obviously occur in carrying out the heating process of Schlinger et al, i.e., the precise composition of the product fluids is seen as dictated by the type of oil shale naturally occurring in the particular oil shale formation actually encountered in the field. Moreover, it would be an obvious matter of choice to operate the Schlinger et al process to minimize what would be considered refinery contaminants, such as sulfur, nitrogen and/or oxygen in the product mixtures. Similarly, it would be obvious to reduce or minimize the amount of asphaltenes in the product mixtures for optimum downstream refining. Moreover, as noted above, Schlinger et al makes repeated references to "superior quality" shale oil, "greater amount of the desirable middle distillate material", "high quality product shale oil", and further observes that "the sulfur and nitrogen content of our shale oil ... 25 to 35 percent lower" (col. 4, lines 22-29). Also, in the event that the particular oil shale deposit encountered yields ammonia gas, it would be an obvious expedient to utilize it in a commercial process such as fertilizer production.

As per claim 1085, the operating pressure range(s) in Schlinger et al of, e.g., 400-600 psig, is clearly in excess of 2.0 bar.

As per claim 1086, Schlinger et al (col. 4, line 49-col. 5, line 6) discloses that hydrogen is also produced with the production effluent; the exemplary range of hydrogen of 45-85 % of a non-condensable gas effluent of the production mixture would inherently or obviously represent a partial pressure of hydrogen > .5 bar.

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As per claim 1088, Schlenger et al also provides for recirculating the hydrogen back to the oil shale formation.

Insofar as the entire process of Schlenger et al is directed to hydrogenating, i.e., hydroretorting of the evolved hydrocarbon(s) from the oil shale, a resulting "heat from hydrogenation" will similarly occur within the oil shale formation, as called for in claim 1089.

As per claims 1091 and 1092, Schlenger et al (col. 5, lines 7-16) further indicates that a fractured and resulting "porous structure of the shale" will occur during their heating process. It is further deemed that such permeability increase will inherently or obviously be substantially uniform, as called for in claim 1092. Such permeability increase is deemed to necessarily or inherently encompass an increase to "greater than about 100 millidarcy", as called for in claim 1091; alternatively, to increase the permeability to greater than 100 millidarcy would have been an obvious matter of choice in order to ensure adequate fluid flow through the formation.

As per claim 1093, Schlenger et al (col. 1, lines 55-75) effects a shale oil yield of "greater than 110 percent of the Fischer Assay". Clearly, such yield is greater than 60% of the Fischer Assay, as recited.

15. Claim 1090 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schlenger et al (3,617,471) and Slater (3,084,919), as applied to claim 1058 above, and further in view of Hoekstra et al (4,353,418) or Garrett (3,661,423).

It would have been obvious to one of ordinary skill in the art to which the invention pertains to hydrogenate the hydrocarbons produced from the heating process of Schlenger et al, which hydrocarbons may be in liquid and/or vaporous form, with hydrogen unreacted and/or produced by the heating/hydroretorting process of Schlenger et al, as applied to the oil shale

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formation of Slater, incorporated therein, as taught by Hoekstra et al (note the Abstract and figure) or Garrett (col. 4, lines 50-54), in order to improve the overall quality of the liquid and/or condensable hydrocarbon fluids produced by Schlinger et al and Slater.

16. Claims 1095 and 1096 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schlinger et al (3,617,471) and Slater (3,084,919), as applied to claim 1058 above, and further in view of Salomonsson (2,914,309) or Camacho et al (4,067,390).

It would have been obvious to one of ordinary skill in the art to which the invention pertains to carry out the multiple well heating embodiment of Schlinger et al, as applied to the oil shale formation as heated and/or completed by Slater (note col. 3, lines 13-29), incorporated therein, by providing or laying out the wells in a triangle, and/or repeating triangle pattern, as disclosed by Salomonsson (note Figure 3 and col. 3, lines 5-34) or Camacho et al (note Figure 8) in order to enhance the overall heating/pyrolysis effected by optimizing well location.

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

18. It is noted that claim 1064 is rejected above only under obviousness double patenting.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Suchfield whose telephone number is 703-308-2152. The examiner can normally be reached on M-F (6:30 - 3:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bagnell can be reached on 703-308-2151. The fax phone numbers for the

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organization where this application or proceeding is assigned are 703-305-7687 for regular communications and 703-305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

George Suchfield
George Suchfield
Primary Examiner
Art Unit 3672

gs
October 8, 2002